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ABSTRACT

Because construction projects produce large amounts of documents, document management is essential for easy access to information. Over the last couple of decades, there has been a notable increase in the use of electronic document management systems (EDMS) in the construction industry. This thesis details the development of an electronic document management system that takes into account the various characteristics of construction project documents (large numbers, mainly in an unstructured textual format, and semantically related) and the project conditions that result in the generation of these documents with the aim of facilitating the document management task in construction projects.

First, a study of the current document management practices in the construction industry and the opinions of the practitioners was performed to identify the extent of use of EDMS's and assess the expectations of practitioners for such systems. The second task was the development of a document discourse model based on the contractual and practical requirements that impact the production of documents in construction projects. The function of the model is to guide users in the process of generating project documents as well as to allow users to group documents according to user-defined categories, thereby facilitating information retrieval and enabling knowledge reuse in the future. The third task involved an investigation in the use of natural language processing techniques to perform automatic classification and grouping of text-based project documents. Various machine learning techniques as well as unsupervised methods were used to identify the most accurate techniques to implement in the proposed EDMS. Finally, a description of the proposed system including the functions of its various components is given. Unlike the majority of EDMS's that focus in the document management task on the post-document generation phase (tasks related to storing, organizing, searching and transmitting of documents), the proposed framework also offers users the ability to perform pre-document generation tasks related to how and when documents should be produced. It is anticipated that the application of the proposed system over successive projects will result in developing a vast, easily-managed repository of construction knowledge.